Reviews and Bibliographical Notices.

I—LEWES: THE PHYSICAL BASIS OF MIND.

THE PHYSICAL BASIS OF MIND. With Illustrations. Being the Second Series of Problems of Life and Mind. By George Henry Lewes. Boston, 1877. 556 pages.

In glancing at the title of this work we were led at once to recall the famous lecture of Prof. Huxley, on the "Physical basis of Life," and all the more so, seeing that Mr. Lewes employs much the same arguments, at least in the preliminary portions of his book, which were used in that lecture.

This volume, while it may be considered as a separate work, is really the latest one of an indefinite series of volumes, the first two having been published under the title—"Problems of Life and Mind." These earlier volumes were composed of separate essays, having the appearance, rather than the fact, of organic connection or arrangement, upon the whole rather tiresome and prolix, and difficult to subordinate to the plain signification of title which had been given them.

Mr. Lewes has been long known as a somewhat brilliant essayist, as a writer in a rather lively and epigrammatic style, as a gentleman of wide culture, possessing strong but rather erratic sympathies, and as having made the laudable endeavor in his culture to secure a ready passport to the scientific, philosophical, and literary domains as contrasted. Apparently he has tried with a set purpose to wipe out the reproach of being a mere metaphysician, or a mere devotee of science, or of literature in general. Has he not written a popular exposition of Comte's "Philosophie Positive," and best of all a "Biographical History of Philosophy," not to mention other productions from the philosophical side? Then has he not produced a charming "Physiology of Common Life," and numerous essays, besides what is contained in the three volumes alluded to in the opening of this notice? Then, finally, has he not given us a notable "Life of Gœthe," and manifested other unmistakable evidences of a lively sympathy with the tides and subtle movements in the wide field of general literature?

But to the medical man he is known, to a certain extent, as a writer on physiological subjects. It would seem, therefore, that as possessing both the literary ability and philosophical and physiological information, he was well fitted to the task of stating at least clearly and concisely, the materialistic or semi-materialistic side of the discussion of the relations of mind and matter. But to those who look for such a statement, we are of the opinion that the book will be a serious disappointment. The argument is certainly far from concise, there are endless repetitions and digressions, and the outcome of the whole is not always easy, at first sight, to define.

The first part of the book, comprising rather more than one-fourth of its contents, is given to the discussion of the very general biological question of the "nature of life." In the language of Mr. Lewes, this section "deals with the specialty of organic phenomena as distinguished from the inorganic." Every problem of mind, he says, is also a problem of life relating to a special group of vital properties, hence the propriety of defining the meaning of the term life before discussing the nature of mental phenomena. Is this definition possible in the sense that would seem to be implied in the title of this section?

Mr. Lewes, here as elsewhere in his more recent writings, classes himself as an "organicist," as distinguished from a vitalist, an animist, or a materialist. The exact signification and justice of this term with these restrictions is not altogether clear. If we understand the author, he, as an organicist, recognizes the peculiar phenomena of vitality as exhibited in the organism, does not attempt to explain them in accordance with physical or chemical laws, but still rejects any assumption of an extra material principle. How far this latter course agrees with a rejection of a modified materialism may be questioned, but we will follow his own language. After stating that there are two diametrically opposed conceptions of vitality, the metaphysiological or extra-organic, that vitality is a vital principle or a force, and what he calls the physiological or organic conception, which he himself adopts, he says, "The conception of an entity must be rejected, because it is metempirical and unverifiable." Starting from this stand-point nearly everything must be rejected, since all our knowledge rests on original assumptions, and we cannot see after reading the author's book that he himself adopts the reasonable course, according to this view, of universal skepticism. And while we cannot, with our present capacities and means of knowledge, state what this assumed vital principle is, yet reasoning by exclusion, we can be sure that it is not one of the ordinary dynamic agencies amenable to physical investigation, which we see elsewhere at work in nature. Mr. Lewes' remarks immediately following the sentence we have quoted, are as follows: "The conception of a force must be rejected because it is irreconcilable with any definite idea we have of force. What the term force signifies in physics and chemistry, namely, mass animated by velocity or *directed pressure*, which is the activity of the agent, is precisely what these vitalists pertinaciously exclude. They assume a force which has nothing in common with mass and velocity; which is not a *resultant*, *but* *a principle;* which instead of being a *directed quantity* is itself autonomous and *directive*, shaping matter into organization, and endowing it with powers not assignable to matter. If this vital force has any mass at its back, it is a spiritual mass; if it is directed, the direction issues from a 'mind somewhere.' Now this conception is purely metempirical." We can fully coincide with what our author says as to the application of the term force; force, properly speaking, is a word not applicable here. The forces at work in organisms are the ordinary forces of nature, but there is something else in living organisms which baffles all definition in terms of physical science, that is not correlated with any known force, can be indefinitely extended, and is completely lost at death. And though it is never found except in connection with organization, there is no reasoning which appears to us conclusive that it is derived from it, and the presumption seems to be altogether in favor of the reverse being the case. The bold statement, therefore, that the conception of a vital principle is purely metempirical seems to us a very poor way of disposing of the something with which we have here to deal. Every theory that we can devise to account for some of the most familiar physiological facts in this connection, such, for example, as the possibilities contained in the ovum or spermatozoon, must necessarily be purely metempirical. Inference has its place, even in this department of science, and when by diagnosis by exclusion, we have only determined what vitality is not, it is not so unreasonable to admit the alternative, though it may not be otherwise demonstrable. The famous Huxleyan comparison of vitality with aquosity is not a good one; we can account for the properties of water or any other compound, by the use of the theory of atoms, the metempirical character of which is very little objected to; but this is not so convenient to explain at once all the phenomena of organisms in which matter is held in so many different chemical combinations and physical conditions, to say nothing of vital processes and complex orders and arrangements.

Coleridge has said, "To account for life is one thing; to explain life another." In the first we have to state its antecedents, its cause; in the second, in the sense in which he used the term, we have only to reduce it to "its simplest and most comprehensive form or mode of action." The title of this section, "The nature of life," would seem to imply both of these, certainly a sufficiently ambitious task. How does Mr. Lewes accomplish it? He quotes a large number of definitions by various authors, ending with the one he most favors, that of Herbert Spencer, that "Life is the continuous adjustment of internal relations to external relations," which for all the words imply may as well refer to a cooling globe as to an organism, and this he supplements with the following: "Life is the functional activity of an organism in relation to its medium, as a synthesis of three terms: structure, aliment and instrument; it is the sum of the functions which are the resultants of vitality; vitality being the sum of the properties of matter in the state of organization." That is, in simple terms, life is the functional activity of the organism and vitality is the sequent of organization. In a subsequent chapter this latter idea is still further maintained, and the author criticizes Mr. Spencer, who was inclined to admit that function might precede structure. We are obliged to again quote our author's own language. "Mr. Spencer, as I have already suggested, seems to have been led into his view by not keeping distinctly present to his mind the differences between properties of tissue and function, the activity of an organ. 'That function takes precedence of structure,' he says, 'seems implied in the definition of life. If life consists of inner actions so adjusted as to balance outer actions—if the actions are the *substance* of life, while the adjustment constitutes its *form;* then may we not say that the actions formed must come before that which formed them—that the continuous change which is the basis of function must come before the structure which brings the functions into shape?' The separation of actions formed from that which forms them is inadmissible. An action cannot come *before* the agent; it is the agent in act. The continuous change, which is the basis of vitality, is a change of molecular arrangements; and the organ which gives a special *direction* to the vital activity, e. g., which shapes the property of contractility into the function of prehension, this organ must itself be formed before it can manifest this function. It is true that in one sense the organs are formed by, or are differentiated in, a pre-existent organism; true that the general activity of living substance must precede the special activity of any organ, as the expansion of steam must precede any steam engine action; but the general activity depends on the general structure, and the special actions on the special structure. If by organization we are to understand not simply organized substance, but a more or less complex arrangement of that substance into separate organs, the question is tantamount to asking whether the simplest animals and plants have life. And to ask the question, whether life precedes organic substance, is tantamount to asking whether the convex aspect of a curve precedes the concave; or, whether the motions of a body precede the body! To disengage ourselves from the complicated suggestions of such a word as life, let us consider one of the vital phenomena, contraction. This is a phenomenon manifested by simple protoplasm, and by the highly differentiated form of protoplasm known as muscle. In one sense it would be correct to say that contractility as a general property of tissue, precedes contraction, which is specialized in muscle. But it would be absurd to say that *muscular* contraction preceded the existence of muscle, and formed it. The contractions of the protoplasm are not the same as muscular contractions, any more than the hand of a baby is the same as a man's; the general property which both have in common depends on the substance both have in common, the special property which belongs to the muscle depends on its special structure. An infinite activity of the contractile protoplasm would be incompetent to form a muscle, unless it were accompanied by that peculiar change in structure which constitutes muscle. The teakettle might boil forever without producing a steam engine or the actions of a steam engine. That which is true of one function is true of all functions, and true of life, which is the sum of vital activities." (p. 85.)

We reproduce this long passage for the reason that it gives as concisely and clearly as is anywhere else given in as many consecutive sentences, the author's position in regard to the mutual relations of vitality and organization, and, as such, since we are examining his book, it is worthy of a careful analysis. In the first place the view here stated, as we understand it, is hardly consistent with the language of the general definition of life and vitality which was quoted as given in a preceding chapter. If life is only a sum of the functions which are the resultants of vitality, and the latter is the sum of the properties of organized matter, then according to this definition some dead matter has life, for it is not specified that the properties must be vital properties,—to make such a distinction would emasculate the definition by leaving the word "vital" still unexplained. Of course such a conclusion cannot be admitted, and the definition is therefore faulty. But, if organized matter can exist for a time and under certain conditions without vitality, and consequently without functions, this fact is certainly not in favor of the theory that life proceeds from organization, for according to that, organization ought to be always attended by vitality.

Again, to ask the question whether the simplest animals and plants have life, might be positively reasonable, according to this definition, since, according to Mr. Lewes' distinction of properties and functions, assimilation, evolution (?), sensibility and contractility, being classed among the former (p. 87), they can scarcely be said to have any functions; and therefore while they possess organization and vitality, they have no functions and therefore no life. So much for some of the defects of the definition.

In the second place, we cannot see either the strength or the consistency of the author's argument from the phenomenon of contraction. While, of course, muscular contraction requires the existence of muscle, as indeed every specialized function requires its special organ, and the word "muscular" necessarily implies the existence of muscle, the illustration is a very inapt one in many respects. Muscular contraction is only the most specialized form of contraction, and in spite of Mr. Lewes' denials, we hold that the contractions of simple tissues are not necessarily different from those of muscle. If the contractility of the protoplasm is utilized for a definite purpose and is not merely a substantial quality, it is functionally identical with the muscular contraction. To say that an infinite activity of contractile protoplasm is incompetent to form a muscle unless accompanied by the peculiar change in structure which constitutes muscle, is to state a truism, absolutely irrelevant to the question. If, however, there is anything in natural selection and evolution, which our author only ignores when it is convenient, this activity of protoplasm has very much to do with producing this change of structure. Most of all, however, we object to the assumption that organization precedes life, by Mr. Lewes, because it is an assumption, and any argument to make it otherwise must necessarily, in our opinion, be reasoning in a circle. And as an assumption it is a purely metempirical one, which he, of all writers, ought to be least guilty of admitting.

There are several other special matters deserving notice in this section of the volume, such for example, as the author's use of terms, some rash general statements, etc., but we must pass them by. The general criticisms will be made when we come to speak of the book as a whole. The second division now claims our attention.

This section, entitled "The Nervous Mechanism," is devoted to what the author styles "the objective analysis of the conditions of mental processes," or, in other words, to the statement and support of his views regarding the physiology of the nervous system, with special reference to the phenomena of mind. This is the portion of the book in which we would look for the most of value in the way of information and the interpretation of established facts. Mr. Lewes has some claims to be considered as a physiologist, and these are here certainly made as prominent as possible. The principal of these claims are the invention of the term *neurility*, and the substitution for what he calls "the superstition of the nerve-cell" of a hypothesis to us not any more reasonable, and lacking even the necessary evidences to entitle it to consideration as opposed to the long accepted views. As these are the main features to be noticed in this section of the book, we shall try to examine them somewhat in detail. First as to *neurility*. This term was proposed by Mr. Lewes in 1859, to express the peculiar vital property of nerves. As the invention of a new name is a very small matter, unless it involves and expresses a new idea, it is needful to see how far this word *neurility* meets these conditions. As here stated the word is applied only to the peripheral nervous system, that is, as we understand, to the nerves proper and not to the ganglionic cells or larger collections of cells, and it is the corresponding neural property to contractility in the muscle. In another place it is defined as "the propagation of molecular change," and elsewhere as the "property of transmitting stimulation." The special property of the centres is said to be sensibility. Now confining this term *neurility* to the nerves alone, and adopting our author's own definition of it, we see no particular difference in its signification from that of the term *conductibility*, as applied to nerve fibres, from certainly a very early period in physiological investigations. Its advantages are in being more special and perhaps more convenient, but it has the disadvantage of not conveying at once any definite idea of its meaning, in this respect being far inferior to contractility or conductibility, which need no translation. We see nothing therefore in the conception implied in this term that is especially novel, but we have no doubt that it will be generally accepted as expressing better than any other single word the vital property of conductibility in nerves and nothing else. That it will immortalize its author other than in a very small way, we doubt, and we hardly appreciate his motives in placing the stress upon it that he does; there is nothing that we see that justifies it, excepting the fact, upon which he felicitates himself, that it has received the sanction of adoption by so eminent an authority in physiology as Professor Vulpian.

In the most general sense in which the word may be used, applying it to the whole nervous system, it implies all nervous action, and is to us too vague and extensive in its signification to be a very valuable addition to our physiological vocabulary. For in spite of what Mr. Lewes says as to the artificial nature of the separation, we cannot admit with him an identity of properties between the nerve centres and the nerve fibres. And this brings us naturally to the second innovation in nerve physiology proposed by our author in his tilt against "the superstition of the nerve cell." The fact of the retardation of nervous impulse by nerve cells, however we may interpret it, certainly indicates a difference in the conductibility, otherwise the neurility, of the cell and the fibre. If this is not so, what is the use of the cell, and why do we have these two varieties of nervous tissue? Then we have the facts demonstrated many years since by Schiff, that a nerve may lose its ability to react to direct external stimulation, while still responding freely to that incited from its centres in a reflex way, which would seem to indicate a decided difference in degree, at least, between the two, of capacity to react to stimuli. Mr. Lewes certainly accepts what seems to us the correct view as to the conduction of nerves, that it is indifferently in either direction, and that their function depends solely on their terminal apparatuses, but what does he make of the central terminal mechanism? It would seem, according to his view, that centres are not essential to nerve action, that a fibre might start from a tactile corpuscle, for example, and terminate in a muscle, and that without the intervention of any centre whatever, a peripheral irritation of the skin might cause contraction of the muscle, and *vice versa*. To suppose this condition of affairs in, at least, the higher organisms, would be an example of "imaginary anatomy" worse than any of that which he so freely condemns. These are only a few of the objections that occur to us to the notions of nerve physiology advanced in the book before us; many more might be adduced, and of the arguments brought forward in defence of the author's views not one is conclusive, nor are the interpretations of the facts on which they are based trustworthy, or the facts themselves altogether incontestable. Indeed, Mr. Lewes has a way of adopting rash generalizations and is now and then guilty of involuntary inaccuracies of statement which makes us distrust his competency for the task he has given himself. As illustrations of these peculiarities we may mention his apparent acceptance of the view that the motor nerve fibre blends directly with the muscular tissue, one which has no support whatever from the latest and best investigations, and such statements as that on page 302, in which it is assumed that the gray substance of the cord is alone essential to motor and sensory transmission, or that on page 235, where Erb and Westphal are quoted as saying that reflex movements follow gentle percussion of the *patella.* His reading appears to be very extensive, but he is very far from being always judicious or judicial in the references he brings forward to support his views—it might be considered too gratuitous an assumption, to suppose him ignorant of many important investigations, the results of which do not especially favor his own hypotheses.

We are therefore not particularly alarmed at the revolutionary ideas of our author in nerve physiology, for we cannot perceive that he has made out his case as well as seems to be his own opinion. As an innovator he has to sustain the burden of proof, and even were his views the ones generally accepted, the facts, as we see them, would incline us to favor opinions not identical with them. To recapitulate. Mr. Lewes holds that identity of tissue everywhere indicates identity of property. Nerve tissue, i. e., the essential part of it, apart from its investments, being everywhere the same, its properties must be the same everywhere, hence he recognizes no difference in the special property of the nerve cell and the nerve fibre, that of both being included under one head, that of neurility. He admits, however, the existence of nerve centres, and for convenience, not as a real distinction, he changes the name of their neurility to sensibility. He admits that nerves conduct indifferently in either direction, their functions being determined by their terminal apparatuses, apparently, in all this, ignoring the fact that the central terminal apparatus is necessarily a nervous one, which, being of the same tissue as the nerves themselves, ought therefore not to possess any special property to affect their function. Indeed, with this distinction which the author makes between function and property, we cannot conceive in what way the former is ever derived from the latter as he says it is, nor do we find in his work any explanation that is at all satisfactory, and notwithstanding the stress he lays upon this distinction, it seems to us there is a curious confusion, if not of the ideas, at least of the terms which represent them, and at all events, a lack of adequate definition. We have already tried to ascertain from the author's words the meaning of his term neurility, and concluded from the most specially expressed definitions, that it was about equivalent to conductibility, but we find it transformed to sensibility, which "on its subjective side is sentience" (p. 220). Again it is said, "sensibility or sentience is the abstract term which expresses all possible varieties of sensation." Still again, the author says that "in the normal organism sensibility means feeling, or consciousness" (p. 402), hence, according to this extension of terms, neurility includes consciousness. This may be a criticism of language rather than of ideas, but it is perfectly justifiable, when, as in the present case, we can, through a series of terms used convertibly, reduce consciousness to conductibility.

These two points of *neurility* and the revolutionary ideas concerning the nerve cell are the ones most strikingly put in this part of the work. We trust that our estimate of them is sufficiently expressed in what has been already said. As to the first, the stress laid upon it by Mr. Lewes is our only excuse for giving any extended notice, and we can say but little more as regards the second, for it will, in our opinion, hardly win for itself much detailed consideration among physiologists. With our present knowledge of the nervous system, it is only surprising that so well informed a man as Mr. Lewes should be inclined to advance and support it.

In the two remaining sections of this work, the author takes up the subjects of animal automatism and the reflex theory. The general argument may be stated to be an attempt to carry the domain of psychology over the whole nervous system, following out after a fashion an idea, that in other ways has been somewhat developed by Pflueger and several other physiologists. Indeed this is a natural inference from what we have already noticed of his views; if he regards consciousness as the same as sensibility, or only an aspect or special mode of the same, and sensibility as holding the same relation to neurility, which in its general sense may be called a universal property of nerve tissue, then, of course, mind is likewise universally distributed throughout the nervous system. But the admission that consciousness is or may be a special mode of sentience confined to the brain, is in our opinion as good as giving away his case, for in whatever way we make our classification, or draw the line, the special character of consciousness is the vital point.

That such an unsatisfactory method of explaining away such a fact as consciousness, or rather such a substitution of a phrase for an argument, can be so satisfactory to Mr. Lewes, indicates a decided defect in his judgment, or, what is more likely, a predisposition to accept any summary disposal of an inconvenient fact.

There are many statements and opinions in these portions of the work with which we can agree, but we are very far from being able (though we think ourselves free from all prejudice in regard to the matter) to accept his general conclusions, as offered here, not, indeed, any more than we were those of the preceding sections. Our disagreement with the work, therefore, is a general one; the author belongs to a section of a school of philosophy, to which, no matter how eminent and numerous its followers may be, we could never reconcile ourselves. The book before us is the result of much thought tinged throughout with the philosophical prepossessions of the author, and exhibiting his incapacity, as it appears to us, to correctly appreciate, in all respects, the subject of the relations of the mind and body. He seems to us to ignore completely a whole class of mental facts, or what we positively believe to be such ; indeed, he would deny altogether the existence of what we may call our spiritual capacities, which though not directly dependent upon our external sensations, we believe to be as truly included among the faculties related to cerebral functions as are intellection and memory. That he is not without an occasional inkling of these we may perhaps believe on his own testimony * given elsewhere, where he relates how once he underwent a temporary conversion to a spiritualistic view of matter and mind. As an illustration of an idiosyncrasy of the author and of his spasmodic sensibility in this direction, we may quote his own words. He says,† "Although my tone of thought is profoundly opposed to spiritualism, I can consistently say that no effort has been wanting on my part to seek out its strongest arguments in the works of all the great teachers. Indeed, there was one brief period when I was very near a conversion. The idea of a noumenal mind, as something distinct from mental phenomena—a something diffused through the organism, giving unity to consciousness, very different from the unity of a machine, flashed upon me one morning with a sudden and novel force, quite unlike the shadowy vagueness with which it had heretofore been conceived. For some minutes I was motionless in a rapt state of thrilled surprise. I seemed standing at the entrance of a new path, leading to new issues, with a vast horizon. The convictions of a life seemed tottering. A tremulous eagerness, suffused with the keen light of discovery, yet mingled with cross-lights and hesitations, stirred me, and from that moment I have understood something of sudden conversions."

The idea of a noumenal mind does not strike the ordinary or even the usual type of extraordinary thinker with the suddenness and novel force above described in such graphic terms, and it indicates a rather peculiar mental constitution when we hear of the "convictions of a lifetime" tottering from the effects of such explosive cerebration as that described. It will help, it appears to us, to account for many other peculiarities and inconsistencies in our author's later writings, some of which we have noticed in this review.

Mr. Lewes goes on to say, in the context of the paragraph quoted from the *Fortnightly Review*, that the intense thought which followed this event seriously affected his health; that he ransacked the authorities and gradually returned to his old stand-point. We will quote his own words again. He says: "I saw that the distinction between a noumenal mind and mental phenomena was a purely logical distinction, transformed into a real distinction; it was the separation of an abstraction from its concretes, such as we make when we separate the abstraction substance from concrete qualities, and this separation, effected logically, we erect into a real distinction by substantializing the abstraction which is then supposed to precede and produce the concretes from which it is raised. The noumenal mind had thus no more warrant than a machine principle apart from all machines, or a vital principle apart from all vital phenomena."

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* *Fortnightly Review*, April, 1876.

† l. c.

Of course we differ with the above, but have neither the time nor space, nor yet the inclination to enter into the metaphysical discussion it involves. The two passages illustrate the normal tendency of the author's "cerebration" and its impulsive aberrations in other directions. Its lack of proper regulation is noticeable all through the present work—the frequent repetitions, the following out of cross suggestions, and the stress laid upon comparatively unimportant matter and the strenuous advocacy of unsupportable theories, which we have noticed, are all in evidence of this fact. Mr. Lewes is a suggestive thinker, but the suggestiveness of his line of thought runs away with him, and we often have as the result a very diluted and occasionally tedious argument.

In conclusion, we have to say, that the "Physical Basis of Mind" is as unexplained after the reading of the work, as it was before, since we cannot admit Mr. Lewes' assumption that, because the phenomena of mind are never seen except in connection with organized matter, they must be considered as caused by it.

II.—THE CONFERENCE OF CHARITIES.

Proceedings of the Conference of Charities—Held in connection with the general meeting of the American Social Science Association, at Saratoga, September, 1877. Boston, Mass.: A. Williams & Co. 1877. 170 pages.

This is the fourth annual report of a body formally consisting of the State Boards of Charity which may be represented in it, but largely made up of delegates from other boards, associations and institutions of a kindred character. Its proceedings have gained in interest and importance with each succeeding year, and such parts as deal with insanity and the insane may properly receive our consideration.

The model upon which State Boards of Charity in this country have been formed, is that of the English Commissioners in Lunacy. To its high intelligence and ability, together with an